SAFETY AND HEALTH PLAN

Falcon Refinery Superfund Site
Ingleside
San Patricio County, Texas
TXD 086 278 058

Prepared for

National Oil Recovery Corporation
3717 Bowne Street
Flushing, NY 11354

Prepared by

BNC Engineering, LLC.
607 River Bend Drive
Georgetown, Texas 78628

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this Safety and Health Plan (SHP) is to establish policies and procedures to protect personnel from potential health hazards associated with work activities at the former Falcon Refinery in San Patricio County, Texas (site). The site occupies approximately 104 acres and is located 1.7 miles southeast of State Highway 361 on FM 2725 at the northwest and southeast corners of FM 2725 and Bishop Road. Additionally, this SHP has been prepared to minimize accidents and injuries that may occur during normal daily activities. This SHP was prepared in accordance with the Occupational Safety and Health Administrations (OSHA's) Standards and Regulations contained in Title 29 CFR Parts 1910 and 1926 including amended sections in 29 CFR 1910.120 and current Recommended Exposure Limits (RELs) as provided by the National Institute for Occupational Safety and Health (NIOSH).

This SHP is designed to ensure the following:

- That field personnel are not adversely exposed to the constituents of concern as well as the physical hazards present;
- That the public welfare or the environment are not adversely impacted by migration of contaminated materials due to work activities; and
- That operations, procedures and equipment will meet the requirements of 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response and the applicable subparts of 29 CFR 1926 and 29 CFR 1910.

A complete copy of the BNC Safety and Health Protocol, which provides additional safety and health details, will be maintained at the site by the Safety Coordinator.

2.0 APPLICABILITY

This SHP applies to activities associated with the Falcon Refinery Superfund Site Removal Action (RA) and Remedial Investigation and Feasibility Study (RI/FS).

3.0 RESPONSIBILITY AND AUTHORITY

The Safety Coordinator (SC) has overall responsibility for safe conduct of all field work, including ensuring full implementation of this plan. The SC will attend to the daily safety and health matters in the field. The SC must be on-site, as applicable, when work is conducted at the site. The SC is authorized to stop work when working conditions become unacceptable and is authorized to dismiss from the project site any worker whose conduct endangers the safety and health of others.

Responsibilities of the SC include:

- Controlling and maintaining access to the work area;
- Implementing the SHP at the initiation of field work;

- Conducting the pre-entry safety briefing for all field personnel with regard to the SHP and other safety requirements to be observed during operations, including:

  - □ Potential hazards;
  - □ Personal protection principles;
  - □ PPE;
  - □ Respiratory protection equipment usage; and
  - □ Emergency response procedures.

- Reviewing and modifying the SHP as additional information becomes available;

- Supervision and enforcement of safety equipment usage;

- Supervision and inspection of equipment cleaning;

- Personnel training in safety equipment and usage;

- Suspending work activities if unsafe working conditions develop;

- Informing employees, nearby workers and visitors of the nature of chemical exposure risk as required by the "Right-to-Know" Law;

- Recommending a medical examination when required for an employee;

- Coordinating the Emergency Response Plan;

- Maintaining a log with a sign in/out sheet for personnel performing activities and visitors entering work areas;

- Investing all accidents, injuries, illness, spills, fires, incidents and near misses; and

- Ensuring that all subcontractors have a SHP.

4.0 PRE-ENTRY BRIEFING

Before activities begin at the site, all field personnel, including subcontractor employees, must be briefed on their work assignments and the provisions of this plan. Each person must acknowledge receipt and willingness to comply by signing the Signature Form. At a minimum, the briefing will:

- Describe the assigned tasks and their potential hazards,

- Coordinate activities,

- Identify methods and precautions to prevent injuries,

- Plan for emergencies,

- Describe any changes in the site specific safety plan,

- Get worker feedback on conditions affecting safety and health,

- Designate emergency evacuation routes prior to beginning of work, and

- Designate on-site and off-site assembly points.

As subsequent phases of a project are undertaken and as new personnel provide services, the plan and Signature Form shall be updated. The Signature Form is presented as APPENDIX A. The Site Standard Operating Procedures are presented as APPENDIX B.

Additionally all subcontractors will be provided with a copy of the approved Removal Action Work Plan as required by the EPA.

5.0 SAFETY AND HEALTH INSPECTIONS

The SC will conduct frequent inspections of site conditions, facilities, equipment, and activities to determine compliance with this SHP. The frequency at which inspections will occur will be at the discretion of the SC and will vary based on the characteristics of the site, the equipment used on-site, and an evaluation of the on-site risk with respect to personnel, equipment, and property.

6.0 EMPLOYEE TRAINING

BNC employees and subcontractors are trained as per the requirements listed in 29 CFR Part 1910.120 (e). The applicable OSHA training requirements are presented below.

- General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

- Workers on-site only occasionally for a specific limited task (such as but not limited to, ground water monitoring, land surveying, or geo-physical surveying) and who are unlikely to be exposed over the permissible exposure limits (PELs) shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

- Workers regularly on-site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

- On-site management and supervisors directly responsible for, or who supervise employee engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience (the training may be reduced to 24 hours and one day if this individual only supervise workers requiring 24 hour training) and at least eight additional hours of specialized training at the time of job assignment.

7.0 SAFETY AND HEALTH RISKS

Health studies have shown that Hazardous constituents may pose potential human health risks, which may vary from person to person. As a precaution, exposure to chemicals of concern or gas liquids, vapors, mists or fumes should be minimized. High vapor concentrations are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic, may cause unconsciousness, and may have other central nervous system effects including death. Skin contact with hot product may cause thermal burns. Prolonged or repeated contact with this product at warm or ambient temperatures tends to remove skin oils, possibly leading to irritation and dermatitis. Eye contact with hot product may cause thermal burns. Contact with this product at warm or ambient temperatures may cause eye irritation but will not damage eye tissue.

Refinery sampling and remediation operations may include benzene as a natural constituent. Benzene can cause anemia and other blood diseases, including leukemia (cancer of the blood-forming system), after prolonged or repeated exposure to high concentrations (e.g., 50-500 PPM). OSHA regulation 29 CFR Part 1910 establishes an action level for benzene of 5 PPM and permissible exposure limited of 10 PPM as an 8-hour time weighted average.

A complete list of OSHA PELs is maintained at the site and will be administered by the SC.

Safety and Health Hazards including potential hazards and precautions, and heat and cold stress are further described on APPENDIX C.

8.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment is divided into four categories (Levels A, B, C and D) based on the degree of protection required.

Level A (SCBA, totally-encapsulating chemical-protective suit, coveralls, gloves, steel toed/shank boots, and hard hat) is selected when the greatest level of skin, respiratory, and eye protection is required.

Level B (SCBA, hooded chemical-resistant clothing, coveralls, gloves, steel toed/shank boots, and hard hat) is selected when the highest level of respiratory protection is necessary but a lesser level of skin protection is needed.

Level C (air purifying respirator, hooded chemical-resistant clothing, gloves, steel toed/shank boots, hard hat, and face shield) is selected when the concentrations and types of airborne substances is known and the criteria for using air purifying respirators are met.

Level D (coveralls, gloves, steel toed/shank boots, safety glasses/goggles, hard hat and face shield) is selected when a work uniform is adequate to afford the protection required to protect against nuisance contamination (29 CFR Part 1910.120).

At a minimum, the following PPE should be available on-site in appropriate sizes for use when needed:

- National Institute for Occupational Safety and Health (NIOSH) approved full or half-face respirator with combination high efficiency particulate air and organic vapor/acid gas cartridge. Respirators must be worn when airborne action levels are reached or exceeded.

- Saranex or polyethylene coated Tyvek coveralls must be worn when the services to be provided will require contact to body parts, other than just hands, with any of the contaminants listed in this SHP.

- Safety goggles or glasses must be worn at all times.

- Hard hat, steel toed shoes with a steel shank must be worn at all times.

- Nitrile gloves, neoprene gloves, or a suitable substitute must be worn when handling soil or waste impacted or potentially impacted with any of the constituents listed in this SHP.

- Neoprene or butyl rubber safety boots, calf-length, must be worn when walking on soil or waste impacted or potentially impacted with any of the constituents listed in this SHP.

- Reflective clothing must be worn in areas with heavy traffic.

- Fire extinguishers must be on-site at all times.

- Ear plugs must be used in environments where the noise level exceeds 85 dBA.

8.1 Respiratory Program

Prior to arriving at the facility personnel will have received training in the use of and been fit tested for a full or half face respirator. During intrusive activities a photo-ionization detector (PID) will be used to monitor for organic vapors and some inorganic gases. Background concentrations will be established prior to commencing work activities at each location.

Sustained (greater than five minutes) air monitoring action levels to determine the level of respiratory protection necessary during field activities will be:

Sustained PID Organic Reading Above Background	Protection Level
0 – 10 ppm	Level D, Modified Level D
1 - 125 ppm	Full or half face air purifying respirator (Level C)
> 125 ppm	Shut down activities

Work will be stopped and the work area will be allowed to vent if monitoring indicates that organic vapors are present at concentrations which present Immediate Danger to Life and Health (IDLH) conditions, or in excess of the protection factor afforded by the air purifying respirator.

8.2 Personal Hygiene

All personnel performing or supervising work within the EZ will observe and adhere to the personal hygiene provisions of this section. The following equipment/facilities are available for personnel:

- Suitable disposable outerwear, gloves, respiratory protection and footwear on a daily basis for the use of field personnel;

- Disposable containers for used outerwear; and

- Potable water and a suitable sanitation facility.

The following regulations will be enforced for all personnel actively participating in the field sampling program:

- Personnel will wear appropriate PPE when in the EZ;

- Used disposable outerwear will not be reused if deemed unsuitable and when removed will be placed inside disposal containers;

- Smoking, eating and drinking will be prohibited within the EZ; and

- Personnel will thoroughly clean their hands, face, neck and other exposed areas before smoking, eating, drinking, and before leaving the CRZ.

9.0 MEDICAL SURVEILLANCE

All employees who are or may be exposed to hazardous substance or health hazards at or above the PELs or, if there is no PEL, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year will be placed on BNC's medical surveillance program.

A licensed physician will determine whether or not personnel can work in a hazardous environment. BNC employees will not wear PPE (such as respirators, encapsulating suits, etc.) if, in the opinion of a licensed physician, the employee might suffer physical or psychological harm due to wearing the PPE. This program is administrated in accordance with 29 CFR 1910.120 (f).

10.0 MONITORING

10.1 Monitoring Instruments

Four instruments are used to monitor for a safe working environment:

- Combustible Gas/Oxygen indicator with readout in % Lower Explosive Limit (LEL) and % Oxygen (O_2).
- Photoionization detector (PID) field survey instrument (HNU or equivalent).
- Hydrogen Sulfide (H_2S) Monitor
- Detector Tube System

10.2 Monitoring Guidelines

Personnel exposure and area monitoring should be performed as often as necessary and wherever necessary to protect field personnel from potential health hazards associated with organic vapors

and hydrogen sulfide. Monitoring must be performed by individuals trained in the calibration, use and care of the required instruments.

10.3 Toxicity Monitoring Action Levels

Initial and periodic monitoring for toxicity action levels should be conducted with a PID when the SC deems necessary. Personnel exposure monitoring should be conducted in the worker's breathing zone, which is a one foot diameter sphere surrounding the worker's head. If vapors are measured continuously and the instrument must be unattended, the detector inlets should be located as close to the worker's breathing zone as possible. Decisions regarding respirator use will be based on breathing zone vapor concentrations of personnel expected to have the greatest exposures. Particular effort should be made to monitor personnel exposures while trenching or boring.

The toxicity action levels will comply with Occupational Safety and Health Administration Permissible Exposure Limits. Respiratory protection must be worn when meter readings, averaged over 10 minutes, equal or exceed the action level for upgrade to Level C personal protective equipment. Workers must be evacuated from the area when organic vapor concentrations exceeding respirator's protection factors are encountered.

10.4 Explosive Action Levels

Explosive monitoring should be conducted when the SC deems necessary, with the detector set at a location near and downwind of the source of emission. Additional monitoring with the LEL monitor should be conducted when organic vapor concentration exceed the ppm range of the PID instrument. If 10% of the LEL is reached, initiate shut-down and evacuation procedures immediately.

The explosive action level below was set to prevent the creation of flammable or explosive atmospheres. Measurements should be taken at all locations where personnel are present or power/hand tools are used.

EXPLOSIVE ACTION LEVELS

Instrument	Action Level to Evacuate Area
Combustible Gas Indicator	10% of LEL

The Combustible Gas Indicator (CGI) alarm (if applicable) should be set to sound at the action level. Hexane, methane, or pentane calibration gas should be used for calibration. When measurements with a CGI indicate the presence of combustible gas levels equal to or exceeding the explosively action level in the work area, the following action must be taken:

- Extinguish all possible ignition sources in the work area and shut down all powered equipment,
- Move personnel at least 100 feet away from work area, and
- Contact the Safety Officer.

After waiting 15 minutes for vapors to dissipate, the SC may use the CGI to cautiously approach the work area to determine the extent and concentration of organic emissions. No personnel may enter any area where CGI readings exceed the explosive action level. Personnel may reenter the work area only by clearance of the SC after the cause of the emission has been determined and the source abated.

11.0 CONFINED SPACE

Confined space is usually defined as a space with limited openings for entry or egress and may require the use of ladders, hoists, or other devices; enclosed such that adequate dilution ventilation is not obtained by natural air movement; not designed for continuous worker occupancy; may be subject to the accumulation of toxic or combustible agents; or may have an oxygen deficiency (less than 19.5% oxygen).

Specific confined space entry procedures are available at the site and will be used and enforced by the SC, if needed.

12.0 SITE CONTROL MEASURES

Access to potentially hazardous areas must be controlled to reduce the probability of occurrence of physical injury and chemical exposure of field personnel, visitors, and the public. The boundaries of a potentially hazardous area shall be identified by barricades or emergency traffic cones or posts, depending on conditions. Trenches and other large holes must be guarded with wooden or metal barricades spaced no further than 20 feet apart and connected with yellow or yellow and black nylon tape no less than 3/4 inches wide. The barricades must be placed no less than two feet from the edge of the excavation or hole.

Entry to a potentially hazardous area shall be limited to individuals who must work in the area. Unofficial visitors will not be permitted to enter while work is in progress. Official visitors will not be allowed to enter a potentially hazardous area unless they are informed of the potential dangers that could be encountered in the area; sign the Signature Form, agree to abide by the provisions of this document, and follow instructions issued by the SC.

Specific work areas will be delineated by temporary fencing or flagging. The following three zones will be described:

- Exclusion Zone (EZ) – This zone will include all areas where potentially contaminated soil or materials are to be handled and all areas where contaminated equipment or personnel travel.

- Contaminant Reduction Zone (CRZ) – This zone will occur at the interface of the EZ and Support Zone (SZ) and will provide access for the transfer of construction materials and field equipment to the EZ.

- Support Zone (SZ) – This area is the portion of the work area defined as the area outside the zone of significant air, liquid and soil contamination.

13.0 SPILL CONTAINMENT

The purpose of this section is to provide contingencies for spills resulting from crude oil liquids or materials brought to the site or produced at the site by field personnel. Every effort should be made to adhere to the procedures presented below.

- After obtaining the proper spill response tools and PPE, attempt to contain the spill so as to prevent its entry into a storm sewer, a drainage ditch, or any conveyance that eventually discharges to surface waters. Equipment and media that can be used to contain spills include absorbent material and absorbent socks.

- At the same time that containment is being conducted or as soon as possible after containment, the field personnel shall attempt to locate the source of the release and if deemed appropriate by the SC, abate the source.

- Once the spill is contained and the source eliminated, the spilled material shall be collected by the appropriate manner and placed into secured container. The area or surface in contact with the spilled material shall be decontaminated by an appropriate method that is permissible under federal, state, and local environmental rules. The specific method used should depend upon the substance, the availability of permitted sewer discharge to a public owned treatment work (POTW), regulatory standards applicable to hazardous and toxic wastes, and other factors.

- All spill material and debris will be managed in a manner that fully complies with applicable federal, state, and local environmental rules regarding recycling or disposal of wastes. The preferred method is to recycle or reclaim materials from spills in an effort to minimize waste generation. Where this is not feasible or allowed, then the collected spilled material will be disposed of in accordance with applicable federal, state, and local rules.

14.0 DECONTAMINATION

According to 29 CFR Part 1910.120 (l), procedures must be established for those projects requiring decontamination and communicated to employees and subcontractors that will work at the site. Decontamination effectiveness must be monitored by the SC. Generally, field decontamination of personnel and equipment is required when working with petroleum substances contaminated with petroleum. BNC's decontamination procedures are presented below.

14.1 Personnel Decontamination

Contamination should be removed from skin using a mild detergent and water. Hot water is more effective than cold water. Liquid dishwashing detergent is more effective than hand soap. Decontaminated wastewater or solution will be disposed of according to federal, state and local rules.

14.2 Equipment Decontamination

Gloves, respirators, hard hats, boots and goggles should be cleaned as described above. Sampling equipment, augers, vehicle undercarriages, and tires should be steam or high-pressure washer cleaned. The steam cleaner is a convenient source of hot water for personnel and protective equipment cleaning but extreme caution must be exercised to prevent burns and equipment damage from elevated temperatures. Never use the steam cleaner directly on the skin.

Decontaminated wastewater or solution will be disposed of according to federal, state and local rules.

15.0 EMERGENCY RESPONSE

All field employees have received training regarding contingency plans for site emergencies. Training was obtained through the 40-hour course on Hazardous Waste Operations and Emergency Response (OSHA 29 CFR Part 1910.120).

15.1 Emergency Response Activities

The procedures listed below should be followed during a site emergency.

- Survey the situation. Do not endanger your own life. DO NOT ENTER A CONFINED SPACE TO RESCUE SOMEONE WHO HAS BEEN OVERCOME unless you are qualified in rescue procedures.

- Call 911 or the fire department immediately. Explain the physical injury, chemical exposure, fire or release.

- If the victim's condition appears to be non-critical, but seems to be more severe than minor cuts, transport the victim to the nearest hospital or clinic listed. If condition is obviously serious, transportation must be done by EMS. Make certain that injured persons are accompanied to the emergency room.

- Complete the Accident/Incident Investigation Report, which is presented as APPENDIX D, within 24 hours and submit this document to the Safety Officer.

15.2 Emergency Contacts and Notification

A list of emergency contact numbers is presented the Emergency Contacts presented as APPENDIX E.

15.3 Emergency Medical Treatment

The SC will assume charge during a medical emergency until the ambulance arrives, or the injured person is admitted to the emergency room. The SC shall conduct the following:

- Prevent further injury;

- Initiate first aid and CPR (if applicable) carefully to avoid bloodborne pathogens;

- Call the ambulance and hospital;

- Determine if decontamination will make injury worse;

- Make certain that injured person is accompanied to emergency room;

- Notify the Safety Manager; and

- Prepare an incident report and submit to the Safety Officer within 48 hours.

15.4 Evacuation

The following activities will be conducted during evacuation:

- Personnel will exit the work area and assemble at the off-site assembly point upon hearing the emergency signal for evacuation.

- The SC will account for all personnel in the off-site assembly zone.

- The SC and a "buddy" will remain after the site has been evacuated (if possible) to assist local responders and advise them of the nature and location of the incident.

15.5 Site Security and Control during Emergencies

- If public evacuation is necessary, responsibility for implementation lies with government authorities.

- When the Fire Department or state regulatory agent arrives, the command, control and responsibility for the site is automatically and instantly transferred to that entity.

- No one is permitted on-site during the emergency, unless exception is individually granted by the incident commander.

- Physical barriers should be immediately erected to indicate the perimeter of the incident area; nonessential personnel and the public must be kept outside of this border.

- To evacuate the public, inform local police to contact Civil Defense or other agencies.

16.0 DISCIPLINARY ACTION

Failure to adhere to and follow the policies and procedures discussed in this SHP may result in disciplinary action including termination of employment or contract.

17.0 PLAN APPROVAL

The SHP has been prepared for use by BNC personnel. BNC claims no responsibility for its use by others, unless specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if these conditions change.

Plan approved by:_____ **Date:**_____

APPENDIX A

SIGNATURE FORM

I have read, understand, and agreed to abide by this site-specific safety and health plan.

COMPANY	PERSONNEL	SIGNATURE	DATE

SITE- SPECIFIC INFORMATION

Safety Coordinator: _____

Site Name: _____

Site Address: _____

Date Site Safety Plan Prepared: _____

Date(s) of Site Work: _____

Site Description and Previous Usage: _____

Description and Size of Work Area: _____

Type of Area: ☐ Industrial ☐ Commercial ☐ Residential

HAZARD EVALUATION

Physical Hazards	Chemical Hazards	Biological Hazards
☐ Heat/Cold Stress	☐ Petroleum/Hydrocarbon	☐ Snakes
☐ Noise	☐ Heavy Metals	☐ Scorpions
☐ Traffic	☐ Asbestos	☐ Insects
☐ Crime	☐ PCB	☐ Other
☐ Underground Utilities	☐ Flammable	(Specify)
☐ Power Lines	☐ Corrosive	_____
☐ Heavy Equipment	☐ Toxic	
☐ Drum Handling	☐ Reactive	
☐ Pits, Ponds, or Surface Water	☐ Unknown	
☐ Confined Spaces/Trenches/Excavations	☐ Other (Specify)	
☐ Other (Specify)_____	_____	

Work Description:

APPENDIX B

STANDARD OPERATING PROCEDURES

1. The buddy system will be used. Hand signals will be established.

2. During site operations, each worker should consider himself as a safety backup to their partner. Off-site personnel provide emergency assistance. All personnel should be aware of dangerous situations that may develop.

3. Visual contact must be maintained between buddies on-site.

4. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated.

5. Prescription drugs should not be taken by personnel where the potential for contact with toxic substances exists, unless specifically approved by a qualified physician. Alcoholic beverage intake is prohibited during the work day.

6. No excessive facial hair which interferes with the satisfactory fit of respiratory protection is allowed on personnel required to wear such equipment. Each staff member must pass the fit-testing for respirators.

7. Contact lenses will not be permitted at the site.

8. Disposable clothing will be used whenever necessary to minimize the risk of cross-contamination.

9. The number of personnel and amount of equipment in any contaminated area should be minimized, but allow for effective site operations.

10. Work areas for various operational activities (equipment testing, decontamination) will be established.

11. Procedures for leaving any contaminated area will be planned and reviewed prior to going on-site.

12. Work areas and decontamination procedures will be established based on prevailing site conditions and are subject to change.

13. Wind indicators will be strategically located on-site.

14. Contact with contaminated or potentially contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, mud, or any discolored ground surface; do not kneel on the ground, lean, sit or place equipment on drum, container, vehicles, or on the ground.

15. No personnel will be admitted to the site without the proper safety equipment.

16. Proper decontamination procedures must be followed before leaving the site.

17. All Personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the Safety Officer will be immediately dismissed.

Tailgate Safety Meetings (TGSM)

To make employees and contractors aware of safety on a daily and timely basis, the Tailgate Safety Meeting (TGSM) has been introduced as a standard practice throughout BNC.

A Tailgate Safety Meeting is to be conducted at a minimum of once every day or once every job or procedure change. Following are the objectives of a TGSM:

- Identify hazards that may interfere with safety performance and determine actions required to eliminate those hazards
- Provide a systematic approach to safety
- Work within and complement other BNC safety programs
- Provide a safe work place with zero safety incidents

Methods

Every employee is responsible for being part of a TGSM.

When working alone, individual employees can review the tasks at hand using the TGSM checklist or by conducting a Job Safety Analysis that includes all aspects of the TGSM.

Employees working as a team or working with contractors should hold TGSMs as a group. Leadership and facilitator roles should be rotated so all team members gain leadership experience and gain ownership of the process.

The Tailgate Safety Meeting begins with a review of the TGSM checklist. Meetings are held with everybody on the job every day and whenever the job or job procedures change. Note that the procedures also cover follow-up in case of an unexpected event in the course of a project.

The TGSM checklist contains a review of the Smith System® and Take Two®, both strong programs of proven benefit. Individual aspects of the job and job requirements also appear on the checklist. These are presented in this form so they may be discussed and checked off one by one.

TGSM CHECKLIST

Smith System® ☐

- Aim high in steering
- Get the big picture
- Leave yourself an out
- Make sure they see you

Take Two® ☐

- Talk: Have I talked to all concerned about what I'm going to do and how it might affect others?
  Have I talked to the right people about any way I see to make the job safer?
- Actions: How can my actions affect my own safety?
  How can my actions affect the safety of others?
- Knowledge: Do I know the procedures, the written ones and the unwritten ones?
  Do I know all of the hazards of the surroundings and the environment, and what to do about them?
- Equipment: Do I have the proper protective equipment for this job?
  Do I have the correct tools and equipment for this particular job, and are they in good condition?

Shut Down Authority ☐	Lights On ☐	Chemical Exposure ☐
Noise/Hearing Protection ☐	Backing ☐	MSDS/HAZCOM ☐
Excavation Safety & Daily Inspection ☐	Hazards w/driving ☐	Hoist/Cables/Slings/ Chains, etc. ☐
PPE ☐	Weather (changes) ☐	Proper and Adequate Training ☐
Lock Out/Tag Out ☐	Heat Stress ☐	Emergency Proc. Reviewed ☐
Written Procedures ☐	Hazards Associated w/Work Task ☐	First Aid/CPR ☐
Confined Spaces ☐	Distractions that May Affect Safety ☐	Work Attitude ☐
Respiratory Safety ☐	Safety Awareness ☐	Communications w/ Contractors ☐
Effect on Adjacent Facilities/Personnel ☐	Proper Tools ☐	State & Federal Notification ☐
Walking/Working Surfaces ☐	Work Permits ☐	Safe Electrical Work Practices ☐
JSA ☐	Ladders ☐	☐
☐	☐	☐

BNC SERVICES
JOB SAFETY ANALYSIS WORKSHEET

INSTRUCTIONS FOR COMPLETING JOB SAFETY ANALYSIS WORKSHEET

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE
Break the job down into steps. Each of the steps of a job should accomplish some major task. The task will consist of a set of movements. Look at the first set of movements used to perform a task, and then determine the next logical set of movements. For example, the job might be to move a box from a truck in the receiving area to a shelf in the storage area. How does that break down into job steps? Picking up the box from the truck and putting it on a hand truck is one logical set of movements, so it is one job step. Everything related to that one logical set of movements is part of that job step. The next logical set of movements might be pushing the loaded hand truck to the storeroom. Removing the boxes from the truck and placing them on the shelf is another logical set of movements. And finally, returning the hand truck to the receiving area might be the final step in this type of job. Be sure to list all the steps in a job. Some steps might not be done each time – checking the casters on a hand truck, for example. However, that task is a part of the job as a whole, and should be listed and analyzed. Number the steps. The number will provide a reference point for the hazards and procedures developed.	Identify the hazards associated with each step. Examine each step to find and identify hazards – actions, conditions and possibilities that could lead to an accident. Number the hazard list to correspond with your steps. It is not enough to look at the obvious hazards. It's also important to look at the entire environment and discover every conceivable hazard that might exist. Be sure to list health hazards as well, even though the harmful effect may not be immediate. A good example is the harmful effect of inhaling a solvent or chemical dust over a long period of time. It's important to list all hazards. Hazards contribute to accidents, injuries and occupational illnesses. In order to do part three of a JSA effectively, you must identify potential and existing hazards. That's why it's important to distinguish between a hazard, an accident and an injury. Each of these terms has a specific meaning: HAZARD – A potential danger. Oil on the floor is a hazard. ACCIDENT – An unintended happening that may result in injury, loss or damage. Slipping on the oil is an accident. INJURY – The result of an accident. A sprained wrist from the fall would be an injury. Some people find it easier to identify possible accidents and illnesses and work back from them to the hazards. If you do that, you can list the accident and illness types in parentheses following the hazard. But be sure you focus on the hazard for developing recommended actions and safe work procedures.	Using the first two columns as a guide, decide what actions are necessary to eliminate or minimize the hazards that could lead to an accident, injury or occupational illness. Number the actions to correspond with the steps and identified hazards. Among the actions that can be taken are (1) engineering the hazard out; (2) providing personal protective equipment; (3) job instruction training; (4) good housekeeping; and (5) good ergonomics (positioning the person in relation to the machine or other elements in the environment in such a way as to eliminate stresses and strains). List recommended safe operating procedures on the form, and also list required or recommended personal protective equipment for each step of the job. Be specific. Say exactly what needs to be done to correct the hazard, such as "lift, using your leg muscles." Avoid general statements like, "be careful." Give a recommended action or procedure for every hazard. If the hazard is a serious one, it should be corrected immediately. The JSA should then be changed to reflect the new conditions.

BNC SERVICES
JOB SAFETY ANALYSIS WORKSHEET

Job:		Page of
Location	Supervisor:	
Date:	Analysis Made By / Reviewed With:	

Personal Protective Equipment required and/or recommended:

Sequence of Basic Job Steps	Potential Accidents or Hazards	Recommended Safe Job Procedure

Identify HAZARDS: Is there a possibility of striking against, being struck by, or making harmful contact with an object; of being caught in, by or between objects; of slipping, tripping or falling; of developing a strain from pushing, pulling, lifting, bending or twisting; of coming in contact with electricity or other power source; of receiving a thermal or chemical burn; of being exposed to a hazardous environment?

APPENDIX C

SAFETY AND HEALTH HAZARDS	
POTENTIAL HAZARD	PRECAUTION
Traffic	Wear fluorescent safety vest. Use cones/barricades to indicate work areas.
Petroleum Products/Methanol Exposure	Stand upwind. Wear PPE as appropriate. Follow decontamination procedure.
Inclement Weather	Stop outdoor work during lightning storms. Take cover indoors or in vehicle.
High Crime Areas	Be aware of surroundings. Request police protection, if appropriate.
Flammability	LEL ≥ 10%, leave area; seek advise on changing atmosphere; DO NOT ENGAGE ANY SPARK PRODUCING SOURCE; prevent electrical engagement; investigate source.
Oxygen Deficiency (O_2 < 19.5%)	Evacuate work area.
Oxygen Enrichment (O_2 > 23.5%)	Evacuate work area.
Flying Debris/Object	Personal protective equipment (PPE). Wear hard hat, safety glasses/goggles, steel toed boots and other PPE as appropriate.
Noise > 85 dBA	Utilize noise protection (ear plugs or ear muffs).
Steep Terrain/Unstable Surface	Brace and shore equipment.
High Pressure Hose Rupture	Check to see that fitting and pressurized lines are in good repair before using.
Electrical Shock	Make certain third wire is properly grounded. Do not tamper with electrical wiring unless qualified to do so.
Suspended Loads	Work is not permitted under suspended loads.
Moving Vehicles	Back-up alarm required for heavy equipment. A spotter should remain in contact with the vehicle operator and signal safe back-up. Personnel to remain outside of turning radius.
Slip, Trip, and Fall Hazards Due to Muddy Work Areas	Use wood pallets or similar devices in muddy work areas. Wear ANSI-approved safety shoes with steel toe and shank (foot bottoms) and non-skid sole.
Falls	All employees on walking/work surfaces with unprotected sides or edges which are 6 feet or more above a lower level will be protected from falling by the use of guard rail systems, safety net systems, or personal fall arrest systems.
Back Injury	Bend knees and use legs muscles or provide mechanical lifting aids.
Overhead Electrical Wires	Heavy equipment (e.g., drill rigs and transport trucks) to remain at least 10 feet from overhead power lines of 50 kV or less. For lines rated over 50 kV, the minimum clearance is 10 feet plus 0.4 inch for each 1 kV over 50 kV.
Trenches/Excavations	Make certain trench meets OSHA standard before entering. All excavations >5 feet deep must be sloped or shored. Excavation >4 feet deep must have a ladder every 25 feet. If not entering trench, remain 2 feet from edge of trench at all times.
Protruding Objects	Flag visible objects.
Buried Utilities, Drums, Tanks, and So Forth	Locate buried utilities, drums, tanks, etc., prior to digging or drilling and mark location.

HEAT STRESS		
ILLNESS	SYMPTOMS	FIRST AID
Heat Cramps	Muscle cramps of arms, legs and/or stomach. Heavy sweating (wet skin) and extreme thirst may occur.	1. Move worker to a shady area and loosen clothing. 2. Slowly give large amounts of cool water. 3. Watch the worker. Continue to give water, if worker accepts it. 4. Get medical help if cramps continue.
Fainting	Feeling weak, dizzy, or exhausted. Temporarily lost of consciousness.	1. Lay the victim down.
Heat Exhaustion	Shallow breathing, pale, cool, moist skin, dizziness, profuse sweating.	1. Move worker to a cool, shady area and loosen/remove clothing. 2. Pour water on worker and fan to permit cooling effect. 3. Have worker slowly drink cool water. 4. Elevate worker's legs. 5. Get medical help if symptoms continue; watch worker until symptoms are gone or medical help arrives.
Heat Stroke - Heat stroke is a medical emergency. Evacuate to a medical facility IMMEDIATELY.	Red, hot, dry skin, no perspiration, nausea, dizziness and confusion, strong - rapid pulse, coma, death.	1. Move worker to a cool, shady area and loosen or remove clothing (remove outer and/or protective clothing if the situation permits. 2. Start cooling the worker immediately. Immerse in water. Fan to cool. Massage extremities and skin. 3. Elevate worker's legs. 4. If conscious, have worker slowly drink cool water.
COLD STRESS		
Cold Stress	Dehydration, frostbite, heavy shivering, excessive fatigue, drowsiness, and irritability.	1. Wear warm clothing. 2. Provide heated shelters (tents, cabins, vehicles, etc.). 3. Provide warm, sweet drinks, and soups.

APPENDIX D

ACCIDENT / INCIDENT INVESTIGATION REPORT

Branch	Department / Department Manager	
Location of Incident	Date of Incident Time ☐ AM ☐ PM	**Date Reported**
Property Owner		

PERSONAL INJURY		**PROPERTY DAMAGE**	
Injured's Name		Property Damaged	
Occupation	Injured Part of Body	Estimated Costs	Actual Costs
Nature of Injury		Nature of Damage	
Object/Equipment/Substance		Object/Equipment/Substance/Inflicting Damage	
Person With Most Control of Object/Equipment/Substance		Person With Most Control of Object/Equipment/Substance	

Post Accident Drug Test Required? Yes _____ No

For Injured? Yes _____ No

For Contributing Parties: List Names

Testing Scheduled By: Date of Test:

DESCRIPTION

Describe Clearly How The Accident Occurred: Attach Accident Diagram For All Motor Vehicle Accidents.

ANALYSIS

What Acts, Failures To Act And/Or Conditions Contributed Most Directly To This Accident?

LOSS SEVERITY POTENTIAL	**PROBABLE RECURRENCE RATE**
☐ Major ☐ Serious ☐ Minor	☐ Frequent ☐ Occasional ☐ Rare

PREVENTION
What Action Has Or Will Be Taken To Prevent Recurrence? Place X by Items Completed.
1. ☐ Date: _____
2. ☐ Date: _____
3. ☐ Date: _____
4. ☐ Date: _____
5. ☐ Date: _____
6. ☐ Date: _____

Investigated By: _____ Date: _____

Reviewed By: _____ Date: _____

Insurance Agent Notified By: _____ Date: _____

Client Notified By: _____ Date: _____

BNC ENGINEERING,

NEAR MISS INVESTIGATION REPORT

Job:	Customer:	Event Date:
Investigator(s):		Date of Investigation:

Witnesses or Persons Knowledgeable of the Near Miss Event:	Their Statements:
1.	
2.	
3.	

Investigator's Description of the Near Miss Event:

Describe the contributing factors and the *Root Cause* of the event:

Corrective Actions Needed to Prevent a Recurrence:	Person Responsible	Completion Date:
1.		
2.		
3.		
4.		

APPENDIX E

EMERGENCY CONTACTS		
NO.	CONTACTS	PHONE NUMBERS
1.	BNC Safety Coordinator: Richard Jennings	361-633-9743
2.	Client Contact - Richard Bergner	713-783-4832
3.	Emergency Medical Service	911
4.	Fire Department	911
5.	Police Department	911
6.	Hospital: Northwest Regional Hospital	361-241-4243
7.	OSHA	800-321-6742
8.	Poison Control	800-764-7661
9.	Chemtrec	800-424-9300
10.	Texas Emergency Response Center	512-463-7727
11.	Railroad Commission (District Office)	512-463-6788
12.	National Response Center	800-424-8802
13.	Texas Commission on Environmental Quality (TCEQ)	512-239-2160
14.	EPA (Region 6)	214-665-2222
15.	DOT Hazardous Materials	202-366-4488